

MONTHLY REPORT OF RIVER/FLOOD CONDITIONS

**TO: NATIONAL WEATHER SERVICE
HYDROMETEOROLOGICAL INFO CENTER
1325 EAST-WEST HIGHWAY
SILVER SPRING, MD 20910**

REPORT FOR:
December 2009

Date: 1/12/10

Signature: Peter Corrigan

Summary: December 2009 continued the very wet and active weather pattern across the Blacksburg Hydrologic Service Area (HSA) that began in November. With moderate El Niño conditions in place (October-December Oceanic Nino Index +1.5) the southern branch of the westerlies remained a breeding ground for repeated episodes of cyclogenesis along the Gulf coast with lows tracking northeast toward the mid-Atlantic coast. One of the biggest snowstorms in over a decade affected the area December 18-19, and moderate rainfall and snowmelt led to some minor flooding just after Christmas. It was the wettest December on record at Roanoke Airport (ROA) and Blacksburg NWS (RNK) and the 2-month period of November-December was also the wettest ever at 4 of the 5 climate observing sites. Mean December precipitation was 7.22 inches versus the long-term average (1971-2000 normal) for this month of 3.12 inches (69 of the 73 cooperative stations reporting), or 231 percent of average. This was the wettest month of any since June 2006 (7.41") and the wettest December since HSA records began in 1996. Precipitation at NWS stations ranged from a low of 4.03" at Bluefield Airport (BLF) in Mercer County, WV to a high of 10.86" at Woolwine (WWLV2) in Patrick County, VA. Monthly average temperatures were generally about 1 to 2 degrees below normal ranging from a low of 32.6°F at Blacksburg (-1.5°) to a high of 38.3°F at Danville (-1.8°).

The first substantial snowfall of the winter occurred from December 4-5 with anywhere from 1 to 6 inches of snow across the western half and little or nothing over the piedmont and foothills. This was followed several days later by a strong low pressure system that tracked into the Great Lakes December 8-9, producing moderate to heavy rainfall across the entire HSA. Numerous Flood Warnings for small streams were issued for mainly the mountain counties early on December 9th and a Flood Watch was later issued for much of the same area due to forecasts of additional rain. 24-hour rainfall amounts ending 12Z on the 9th ranged from 1 to 3 inches (see Figure 1 below), with the highest amounts in the mountains. Top gage reports included Peak Creek IFLOWS (PCRV2) 3.08", Fairwood IFLOWS (FWDV2) 3.04", Cassidy Bridge IFLOWS (CSBV2) 2.88", Little Brushy IFLOWS (LBV2) 2.76" and Sloan Branch IFLOWS (SLOV2) 2.60". There was minor flooding on a number of rivers and streams, primarily in the upper Roanoke River basin and lower Dan River. The Roanoke River reached 8.14 feet at the Walnut Street USGS gage (RONV2), a little less than 2 feet below flood stage.

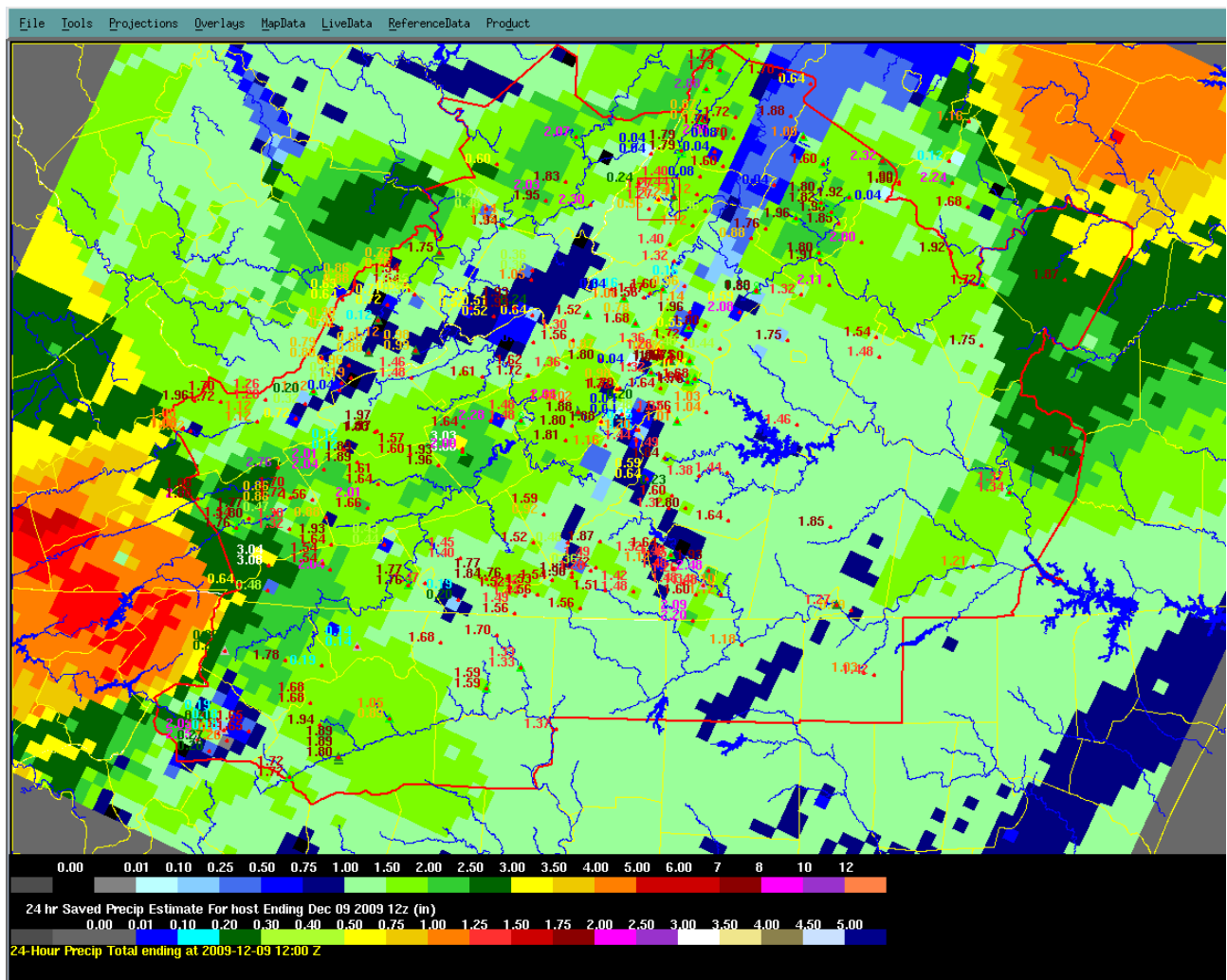
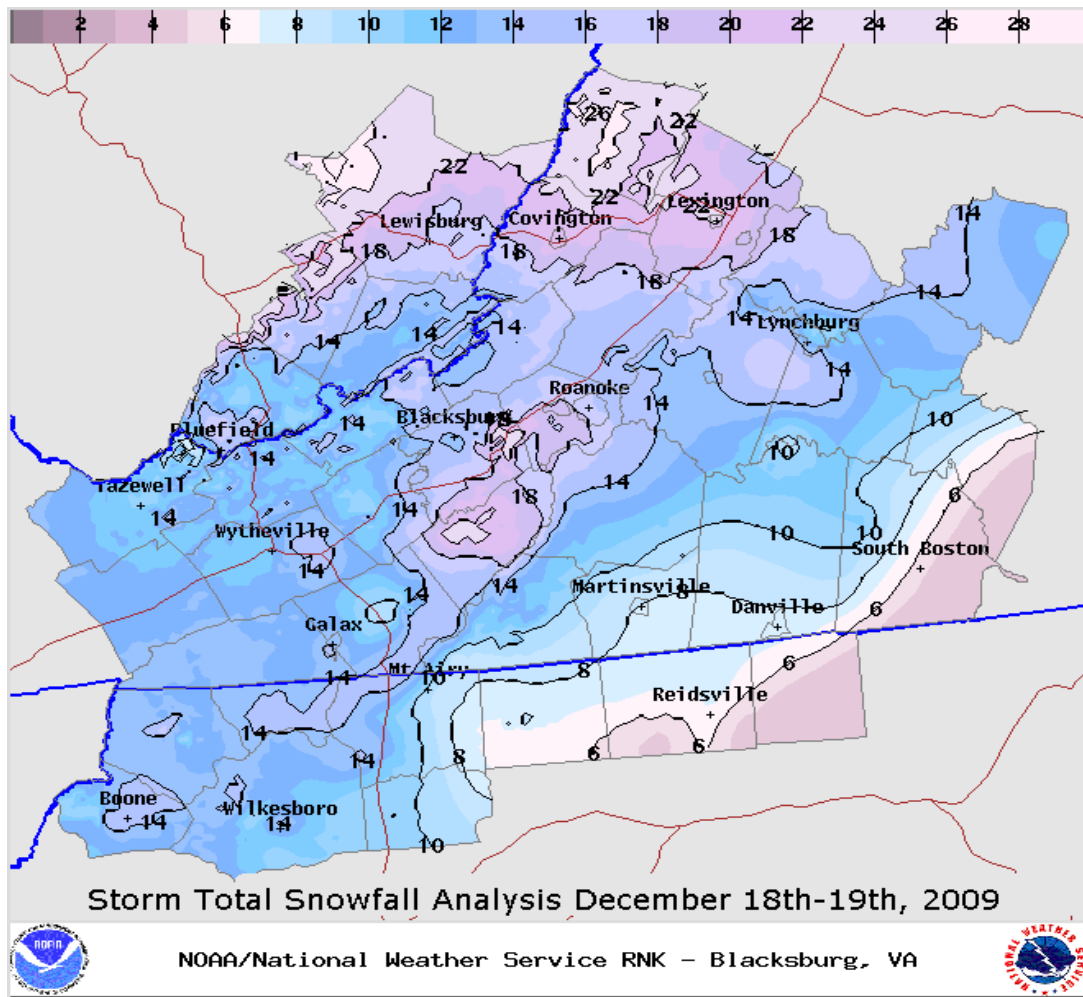


Figure 1. 24-hour basin-average MPE rainfall (with rain gage totals) 12Z December 9, 2009

Yet another low pressure center tracked out of the Gulf of Mexico toward the North Carolina coast December 13-14 bringing another round of moderate to heavy rainfall. The Roanoke River saw a renewed sharp rise but remained below flood stage, in response to the 1 to 2 inches of rain that fell across much of the basin. An areal Flood Warning for several counties and the City of Salem in the upper Roanoke basin was issued as reports of minor lowland flooding were received.

A major snowstorm affected the entire region and east coast of the U.S. from December 18-19, bringing 6 to over 25 inches of snow across the HSA. The highest snow amounts were in the upper James and Greenbrier basins while the lowest totals were reached in the southeast piedmont. Both Roanoke (17.8") and Blacksburg (14.4") had December snowfall records and it was the biggest snowstorm in over 10 years across most of the area. Snow ratios were roughly 10-1, so that the water content ranged from about 1 to 2 inches across the area. The figure below shows snow totals from this event.



Another significant storm affected the area around December 25-26, this time primarily bringing rain or freezing rain along with high winds. Table 1 below shows 36-hour precipitation totals from this event. Precipitation amounts were much lower in the far west, with generally under 0.25 inches, while the portions of the Dan, Roanoke and middle James basins picked up 1 to 3 inches. Fortunately, temperatures in the areas of heavy snowpack were cool throughout the event, even after a changeover to all rain and generally remained within a degree or two of freezing. This greatly limited the amount of snow melt in these areas. Still, the combination of new precipitation and snowmelt further east caused some fairly significant flooding in parts of the lower Roanoke and Dan river basins. The Dan River at South Boston crested about a foot below Moderate Flood stage and the Roanoke River at Randolph just below Moderate flood stage. Small stream flooding was minor or non-existent.

Table 1 – Top ten 36-hour Precipitation amounts: RNK HSA – valid 1200 UTC, 12/26/09

SHEF ID	Station	County	Type	Precipitation
LRLN7	LAUREL SPRINGS	WILKES	RAWS	2.97
IRIV2	IRISH GAP	ROCKBRIDGE	IFLOWS	2.76
FYGV2	FANCY GAP	CARROLL	IFLOWS	2.48
SUGV2	SUGARLOAF MTN.	ROANOKE	IFLOWS	2.48
EKVN7	ELK CREEK	WILKES	DCP	2.33
BLAV2	BLACKWATER/CALLAWAY	FRANKLIN	IFLOWS	2.28
BONN7	BOONE	WATAUGA	DCP	2.25
MLMV2	MILL MOUNTAIN	ROANOKE	IFLOWS	2.24
JOEV2	JONES CREEK	HENRY	IFLOWS	2.24
MHCV2	MT HERMON CHURCH	HENRY	IFLOWS	2.20
ORIV2	ORISKANY	BOTETOURT	IFLOWS	2.16
MONV2	MONTEBELLO FISH HAT.	NELSON	IFLOWS	2.08

December 2009 was among the wettest on record at NWS climate stations in the area. The table below shows the December precipitation and rankings at 4 of the ASOS climate sites (Bluefield was not in the top ten of wettest Decembers). Combined with the very wet November the 2-month periods also established records at a number of sites.

Station	Dec. 2009	Rank	Old Record	Year	Yrs. of Data
Roanoke (ROA)	8.22	1 st	7.10	1948	98
Blacksburg (RNK)	6.66	1 st	6.03	1973	58
Lynchburg (LYH)	6.82	3 rd	8.72	1901	118
Danville (DAN)	5.73	5 th	6.98	1958	63

2009 Annual Hydrologic Summary:

2009 will go down as the wettest year in the HSA since 2003 with average annual rainfall at 69 NWS Cooperative and ASOS sites of 53.10" (2003 had 59.81"). This represents 119% of the 1971-2000 normal of 44.55". Annual station precipitation ranged from a low of 43.00" at Gathright Dam, VA (GDMV2) to a high of 69.54" at Boone, NC (BOON7). The wettest month was December (7.22") followed by May (7.20"). In spite of the very wet year, flooding was not particularly widespread or severe.

The year began with much of the area still lingering in either Moderate Drought or Abnormally Dry conditions according to the U.S. Drought Monitor. This drought had persisted in parts of the area since early 2007 and was especially severe in parts of North Carolina. January 2009 began the year with near normal precipitation, but February was quite dry and ended up being by far the driest month of the year at 1.19", only a little over 33% of average precipitation. The first two spring months of March-April saw roughly normal precipitation and only sporadic flooding. May however, was very wet with a number of significant flash flood events, most notably over southeast West Virginia on May 8th and over parts of the New River Valley May 14-15. Severe urban flash flooding affected the town of Christiansburg in Montgomery County, VA when 2.5 to 4 inches fell in a few hours directly over the urbanized center of town during the early morning of May 15th. Property and infrastructure damage was substantial but no injuries or fatalities occurred. Early to mid-June

remained very active with several flash flood events, most notably on June 4-5, when several gages in the southeast HSA measured over 4 inches of rain in 24 hours along a stationary frontal boundary. July and August were both slightly wetter than normal but with no outstanding flood events. Only pockets of flash flooding occurred in these summer months and almost no river flooding. September began very dry but a very wet period from September 25-26 brought moderate to heavy rains to much of the area yet only minor flooding. Several rain gages in southeast West Virginia recorded over 4 inches in 24-hours. October was the second driest month of 2009 at 2.88" and no flooding. November was marked by the only incursion of an organized tropical system into the region. Creating perhaps the most significant flooding of the year, the remnants of Hurricane Ida tracked across the region November 11-12, bringing widespread rainfall of about 3 to 6 or more inches. Several IFLOWS stations in Henry, Roanoke and Patrick counties recorded 2-day rainfall totals over 7 inches which were the highest amounts of the 2009 year. Most of the river flooding from this event occurred in the Dan and Roanoke river basins where moderate to near major flood levels were reached. November rainfall of 12.07 inches at Yanceyville in Caswell County, NC was the highest monthly total at any station during the year. December continued the wet pattern established in November as a moderate El Niño contributed to frequent storm development in the Gulf of Mexico. The highlight of the month was the major snowstorm that brought anywhere from 6 to 25 inches of snow December 18-19. Minor river flooding followed just after Christmas in the lower Dan and Roanoke basins as the snow in the piedmont melted off under heavy rains.

Non-Routine Hydrologic Product Summary (Dec):

Flood/Flash Flood Watches (FFARNK): 2

Flood Advisories (Urban/Small Stream - FLSRNK): 0

Flash Flood Warnings (FFWRNK): 0

Areal Flood Warnings (FLWRNK): 49

River Flood Warnings (FLWRNK - forecast points): 9

NWS FORM E-3 U.S. DEPARTMENT OF COMMERCE NOAA, NATIONAL WEATHER SERVICE FLOOD STAGE REPORT		HYDROLOGIC SERVICE AREA: Blacksburg, VA (RNK)				
		MONTH: December			YEAR: 2009	
RIVER AND STATION	FLOOD STAGE (FEET)	ABOVE FLOOD STAGE		CREST		
		FROM	TO	STAGE (FEET)	DATE	TIME (UTC)

Dan River

Danville (DVLV2)	17	12/26/09	12/27/09	17.71	12/26/09	2115
Paces (PCEV2)	20	12/27/09	12/27/09	21.26	12/27/09	0415
South Boston (SBNV2)	19	12/10/09	12/11/09	21.50E	12/11/09	0200
		12/26/09	12/28/09	23.85	12/27/09	2200

Roanoke River

Randolph (RNDV2)	21	12/10/09	12/11/09	23.93	12/10/09	1945
		12/14/09	12/16/09	23.85	12/15/09	0315
		12/26/09	12/28/09	23.65	12/27/09	1645

James River

Bremo Bluff (BREV2)	19	12/10/09	12/11/09	20.00	12/11/09	0318
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MIC RNK
 NWS HIC
 NWS ER
 SERFC
 LMRFC
 OHRFC
 MARFC